CLAIMS

1. A recombinant *agfA* gene in which a segment of the gene has been replaced by a segment of a foreign DNA sequence, that foreign sequence encoding a foreign epitope or antigen.

2. A recombinant *agfA* gene in which one or more segments of the gene have been replaced by segments of foreign DNA sequence(s), the foreign sequence(s) encoding a foreign epitope(s) or antigen(s).

3. The recombinant gene according to any one of claims 1 and 2 wherein the said recombinant *agfA* gene is present in an expression vector construct capable of producing recombinant AgfA fimbrin proteins in a strain of *Salmonella.*

4. The recombinant gene according to any one of claims 1 and 2 wherein the said recombinant *agfA* gene is present in an expression vector construct capable of producing recombinant AgfA fimbrin proteins in a strain of *E. coli.*

5. The recombinant gene according to any one of claims 1 and 2 wherein the said recombinant *agfA* gene is present in an expression vector construct capable of producing recombinant AgfA fimbrin proteins in a strain of Enerobacteriaceae.

6. The recombinant gene according to any one of claims 1 and 2 wherein the said recombinant *agfA* gene is present in an expression vector construct capable of producing stable fimbriae comprising recombinant AgfA protein in a strain of *Salmonella.*

7. The recombinant gene according to any one of claims 1 and 2 wherein the said recombinant *agfA* gene is present in an expression vector construct capable of producing stable fimbriae comprising recombinant AgfA protein in a strain of *E. coli.*

8. The recombinant gene according to any one of claims 1 and 2 wherein the said recombinant *agfA* gene is present in an expression vector construct capable of producing stable fimbriae comprising recombinant AgfA protein in a strain of *Enterobacteriaceae*.

9. The recombinant gene according to any one of claims 1-3, 6 wherein the said recombinant *agfA* gene is present in the chromosome of a strain of *Salmonella*.

10. The recombinant gene according to any one of claims 1-3, 6 wherein the said recombinant *agfA* gene is present in the chromosome of a strain of *Salmonella*, as a replacement of the native *agfA* gene.

11. The recombinant gene according to any one of claims 1,2,4,7 wherein the said recombinant *agfA* gene is present in the chromosome of a strain of *E. coli*.

12. The recombinant gene according to any one of claims 1,2,4,7 wherein the said recombinant *agfA* gene is present in the chromosome of a strain of *E. coli*. as a replacement of the native *csgA* gene.

13. The recombinant gene according to any one of claims 1,2,5,8 wherein the said recombinant *agfA* gene is present in the chromosome of a strain of *Enterobacteriaceae*.

14. The recombinant gene according to any one of claims 1,2,5,8 wherein the said recombinant *agfA* gene is present in the chromosome of a strain of Enterobacteriaceae as a replacement of the native homologous gene.

15. The recombinant gene according to any one of claims 1-14 wherein said recombinant gene is an *agfB* recombinant gene.

16. The recombinant gene according to any one of claims 1-14 wherein said recombinant gene is an *csgA* recombinant gene.

17. The recombinant gene according to any one of claims 1-14 wherein said recombinant gene is an *csgB* recombinant gene.

18. The recombinant gene according to any one of claims 1-14 wherein said recombinant gene is an Enterobacteriaceae homologue of the *agfA* or *agfB* recombinant genes.

19. The recombinant gene according to any one of claims 9, 10 wherein said recombinant strain of *Salmonella* is capable of producing recombinant AgfA fimbrin proteins.

20. The recombinant gene according to any one of claims 11, 12 wherein said recombinant strain of *E. coli* is capable of producing recombinant AgfA fimbrin proteins.

21. The recombinant gene according to any one of claims 13, 14 wherein said recombinant strain of Enterobacteriaceae is capable of producing recombinant AgfA fimbrin proteins.

22. The recombinant gene according to any one of claims 19-21 wherein said recombinant fimbrin protein is a recombinant AgfB fimbrin protein.

23. The recombinant gene according to any one of claims 19-21 wherein said recombinant fimbrin protein is a recombinant CsgA fimbrin protein.

24. The recombinant gene according to any one of claims 19-21 wherein said recombinant fimbrin protein is a recombinant CsgB fimbrin protein.

25. The recombinant gene according to any one of claims 19-21 wherein said recombinant fimbrin protein is a recombinant homologue of an AgfA or AgfB fimbrin protein.

26. The recombinant gene according to any one of claims 9, 10 wherein said recombinant strain of *Salmonella* is capable of producing stable fimbriae comprising recombinant AgfA fimbrin protein.

27. The recombinant gene according to any one of claims 11, 12 wherein said recombinant strain of *E. coli* is capable of producing stable fimbriae comprising recombinant AgfA fimbrin protein.

28. The recombinant gene according to any one of claims 13, 14 wherein said recombinant strain of Enterobacteriaceae is capable of producing stable fimbriae comprising recombinant AgfA fimbrin protein.

29. The recombinant gene according to any one of claims 26-28 wherein said fimbriae are comprised of recombinant AgfB fimbrin protein.

30. The recombinant gene according to any one of claims 26-28 wherein said fimbriae are comprised of recombinant CsgA fimbrin protein.

31. The recombinant gene according to any one of claims 26-28 wherein said fimbriae are comprised of recombinant CsgB fimbrin protein.

32. The recombinant gene according to any one of claims 26-28 wherein said fimbriae are comprised of recombinant AgfA and AgfB fimbrin proteins.

33. The recombinant gene according to any one of claims 26-28 wherein said fimbriae are comprised of recombinant CgsA and CsgB fimbrin proteins.

34. The recombinant gene according to any one of claims 26-28 wherein said fimbriae are comprised of recombinant homologue of an AgfA or AgfB fimbrin protein.

35. The use of the SEF17/TAF nucleation dependent assembly system of strains of *Salmonella* for the production of fimbriae comprising recombinant AgfA subunits.

36. The use of the SEF17/TAF homologue curli nucleation dependent assembly system of strains of *E. coli* for the production of fimbriae comprising recombinant CsgA subunits.

37. The use of the SEF17/TAF homlogues nucleation dependent assembly systems of strains of Enterobacteriaceae for the production of fimbriae comprising recombinant, AgfA-homologue fimbrin subunits.

38. A method of eliciting an immune response in an animal comprising:

(a) separating an amino acid polymer comprising a recombinant AgfA protein containing a replacement segment or segments of foreign amino acid sequence or sequences grown on a *Salmonella* host cell from said *Salmonella* host cell; and

(b) introducing said amino acid polymer into said animal in conjunction with a physiological carrier or diluent.

39. A method of eliciting an immune response in an animal comprising:

(a) separating an amino acid polymer comprising a recombinant AgfA protein containing a replacement segment or segments of foreign aminoacid sequence or sequences grown on a *E. coli* host cell from said *E. coli* host cell; and

(b) introducing said amino acid polymer into said animal in conjunction with a physiological carrier or diluent.

40. A method of eliciting an immune response in an animal comprising:

(a) separating an amino acid polymer comprising a recombinant AgfA protein containing a replacement segment or segments of foreign aminoacid sequence or sequences grown on a Enterobacteriaceae host cell from said Enterobacteriaceae host cell; and

(b) introducing said amino acid polymer into said animal in conjunction with a physiological carrier or diluent.

41. The recombinant gene according to any one of claims 38-40 wherein said recombinant protein is AgfB recombinant protein.

42. The recombinant gene according to any one of claims 38-40 wherein said recombinant protein is CsgA recombinant protein.

43. The recombinant gene according to any one of claims 38-40 wherein said recombinant protein is CsgB recombinant protein.

44. The recombinant gene according to any one of claims 38-40 wherein said recombinant protein is an AgfA or AgfB homologue recombinant protein.

45. A method of eliciting an immune response in an animal comprising:

(a) separating a fimbriae comprising a recombinant AgfA protein containing a replacement segment or segments of foreign amino acid sequence or sequences grown on a *Salmonella* host cell from said *Salmonella* host cell; and

(b) introducing said fimbriae into said animal in conjunction with a physiological carrier or diluent.

46. A method of eliciting an immune response in an animal comprising:

(a) separating a fimbriae comprising a recombinant AgfA protein containing a replacement segment or segments of foreign amino acid sequence or sequences grown on a *E. coli* host cell from said *E. coli* host cell; and

(b) introducing said fimbriae into said animal in conjunction with a physiological carrier or diluent.

47. A method of eliciting an immune response in an animal comprising:

(a) separating a fimbriae comprising a recombinant AgfA protein containing a replacement segment or segments of foreign amino acid sequence or sequences grown on a Enterobacteriaceae host cell from said Enterobacteriaceae host cell; and

(b) introducing said fimbriae into said animal in conjunction with a physiological carrier or diluent.

48. The recombinant gene according to any one of claims 45-47 wherein said fimbriae is comprised of an AgfB recombinant protein.

49. The recombinant gene according to any one of claims 45-47 wherein said fimbriae is comprised of an CsgA recombinant protein.

50. The recombinant gene according to any one of claims 45-47 wherein said fimbriae is comprised of an CsgB recombinant protein.

51. The recombinant gene according to any one of claims 45-47 wherein said fimbriae is comprised of an AgfA or AgfB homologue recombinant protein.

52. The recombinant gene according to any one of claims 45-47 wherein said fimbriae is comprised of an AgfA and AgfB homologue recombinant protein.

53. The recombinant gene according to any one of claims 45-47 wherein said fimbriae is comprised of an CsgA and CsgB homologue recombinant protein.

54. A method for directing recombination of a recombinant gene into the chromosome of the homologous species.

55. A method for directing recombination of a recombinant gene back into the chromosome of the homologous species thereby replacing the native copy of that gene.

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